

**UNIT 1: CELLS, ORGAN SYSTEMS AND ECOSYSTEMS
FOUNDATION TIER**

MARK SCHEME

GENERAL INSTRUCTIONS

Recording of marks

Examiners must mark in red ink.

One tick must equate to one mark (apart from the questions where a level of response mark scheme is applied).

Question totals should be written in the box at the end of the question.

Question totals should be entered onto the grid on the front cover and these should be added to give the script total for each candidate.

Marking rules

All work should be seen to have been marked.

Marking schemes will indicate when explicit working is deemed to be a necessary part of a correct answer.

Crossed out responses not replaced should be marked.

Credit will be given for correct and relevant alternative responses which are not recorded in the mark scheme.

Extended response question

A level of response mark scheme is used. Before applying the mark scheme please read through the whole answer from start to finish. Firstly, decide which level descriptor matches best with the candidate's response: remember that you should be considering the overall quality of the response. Then decide which mark to award within the level. Award the higher mark in the level if there is a good match with both the content statements and the communication statements.

Marking abbreviations

The following may be used in marking schemes or in the marking of scripts to indicate reasons for the marks awarded.

cao = correct answer only
ecf = error carried forward
bod = benefit of doubt

Question		Marking details		Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
1	(a)		<p>For each cell the correct organelles should be drawn in the correct location in the cell</p> <p>Root cell: nucleus (1) mitochondria (1) If chloroplast drawn and labelled (– 1).</p> <p>Palisade cell: Nucleus (1) Mitochondria (1) Chloroplasts (1)</p> <p>Animal cell: Nucleus (1) Mitochondria (1) If chloroplast drawn (-1)</p>	7			7		
	(b)		<p>A Cell wall (1) B Cell membrane (1)</p>	2			2		
			Question 1 total	9	0	0	9	0	0

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Question				Marking details	Marks Available					
					AO1	AO2	AO3	Total	Maths	Prac
2	(a)	(i)		60 °C		1		1	1	
		(ii)		0.5 g		1		1	1	
	(b)			$\frac{20.0 \times 60 \times 4.2}{1000 \times 0.5}$ (1) 10.1 kJ/g (1)	1	1		2	2	
	(c)			Insulate the apparatus/ use a calorimeter/ make sure all the food burns			1	1		1
	(d)	(i)		Black coffee		1		1		
		(ii)		No fat in skimmed milk		1		1		
		(iii)		Chocolate mocha with whole milk (1) has most fat (1) has most sugar (1)			3	3		
				Question 2 total	1	5	4	10	4	1

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
3	(a)	(i)	Arrow pointing towards alveoli	1			1		
		(ii)	A Bronchiole (1) B Alveolus (1)	2			2		
		(iii)	Any 2 x (1) from: large surface area moist surface rich blood supply thin	2			2		
	(b)	(i)	Rubber sheet		1		1		
		(ii)	Trachea		1		1		
		(iii)	Lungs		1		1		
	(c)	(i)	2 [dm ³]		1		1	1	
		(ii)	2 x 20/100 (1) e.c.f from (i) 0.4 [dm ³] (1)		2		2	2	
			Question 3 total	5	6	0	11	3	0

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Question				Marking details	Marks Available					
					AO1	AO2	AO3	Total	Maths	Prac
4	(a)	(i)		To keep it air-tight/ maintain sealed unit		1		1		1
		(ii)		Allow light in/ for photosynthesis		1		1		
	(b)			Provide oxygen (1) Provide food (1)		2		2		
	(c)	(i)		D		1		1		
		(ii)		B		1		1		
					Question 4 total	0	6	0	6	0

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
5	(a)		No bioaccumulation/ build up of concentration/ more host specific/ does not kill useful insects		1		1		
	(b)	(i)	Increase (1) More spruce to eat (1)			2	2		
		(ii)	Decrease (1) No great spruce beetle to eat (1) OR Increase (1) More moths and more spruce trees to eat (1) Effect should link to the explanation, only award 'increase' or 'decrease' if explanation correct			2	2		
		(iii)	Increase (1) More mice to eat (1)			2	2		
			Question 5 total	0	1	6	7	0	0

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Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
6	(a)	(i)	All labels correct (2) two labels correct (1)	2			2		
		(ii)	Carries deoxygenated blood/ less oxygen/ more carbon dioxide	1			1		
		(iii)	Needs to pump/force blood around the body	1			1		
(b)	(i)	Colin 89 (1) Tracy 72 (1)		2		2	2		
	(ii)	Boys have higher rates than girls		1		1			
(c)		Heart muscle needs more oxygen (1) to pump blood faster (1) Leg muscles need more oxygen (1) to release more energy (1) (to do more work)		4		4			
			Question 6 total	4	7	0	11	2	0

Question	Marking details	Marks Available					
		AO1	AO2	AO3	Total	Maths	Prac
7	<p>Indicative content: Note level of bubble to start. Leave for stated time. Note final level of bubble. Calculate rate. Use new air bubble (Squeeze plastic tubing to push air bubble out). Note level. Switch on fan. Leave for same time as before. Note level of bubble. Calculate rate.</p> <p>5 – 6 marks Detailed account including all steps in method and repeats. A clear explanation of how to calculate rate. <i>There is a sustained line of reasoning which is coherent, relevant, substantiated and logically structured. The candidate uses appropriate scientific terminology and accurate spelling, punctuation and grammar.</i></p> <p>3 – 4 marks Account testing both still and moving air but without clear detail of how to calculate rate or mention of repeats <i>There is a line of reasoning which is partially coherent, largely relevant, supported by some evidence and with some structure. The candidate uses mainly appropriate scientific terminology and some accurate spelling, punctuation and grammar.</i></p> <p>1-2 marks Basic account without reference to fan, repeats or calculation of rate. <i>There is a basic line of reasoning which is not coherent, largely irrelevant, supported by limited evidence and with very little structure. The candidate uses limited scientific terminology and inaccuracies in spelling, punctuation and grammar.</i></p> <p>0 marks <i>No attempt made or no response worthy of credit.</i></p>	6			6		6
	Question 7 total	6	0	0	6	0	6

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Question				Marking details	Marks Available					
					AO1	AO2	AO3	Total	Maths	Prac
8	(a)			5		1		1	1	
	(b)			Increases (1) because fewer microbes use it for respiration (1)			2	2		
	(c)			Point 2 (1) Least oxygen present (1)			2	2		
	(d)			Indicator (1)	1			1		
				Question 8 total	1	1	4	6	1	0

Question				Marking details	Marks Available					
					AO1	AO2	AO3	Total	Maths	Prac
9	(a)	(i)		osmosis	1			1		
		(ii)	I	For 1.0M water passed into sugar solution (1) from high water conc to lower water conc/down gradient (1).		2		2		2
			II	For 0.2M water passed in and out of potato at same rate (1) because inside and out is same (1)		2		2		2
	(b)			Boiling destroys SPM (1) so osmosis does not take place/solution can pass through (1)	2			2		2
				Question 9 total	3	4	0	7	0	6

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Question				Marking details	Marks Available					
					AO1	AO2	AO3	Total	Maths	Prac
10	(a)	(i)		6		1		1	1	1
			(ii)	B at pH8		1		1	1	1
		(b)		Stomach (1) Pancreas (1) Small intestine (1)	3			3		
		(c)		Stomach (1) Digests most protein in acid pH (1)			2	2		
				Question 10 total	3	2	2	7	2	2

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SUMMARY OF MARKS ALLOCATED TO ASSESSMENT OBJECTIVES

Question	AO1	AO2	AO3	TOTAL MARK	MATHS	PRAC
1	9	0	0	9	0	0
2	1	5	4	10	4	1
3	5	6	0	11	3	0
4	0	6	0	6	0	1
5	0	1	6	7	0	0
6	4	7	0	11	2	0
7	6	0	0	6	0	6
8	1	1	4	6	1	0
9	3	4	0	7	0	6
10	3	2	2	7	2	2
TOTAL	32	32	16	80	12	16

